

Pandemic preparedness and hard to reach populations

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At the time of this writing, more than a dozen countries have reported human cases of highly pathogenic avian H5N1 influenza, with over a 50 percent case fatality rate.¹ This has contributed to concerted public health efforts that aim to mitigate the consequences of a potential influenza pandemic.² Pandemic preparedness efforts are concerned primarily with efforts to reduce transmission by infected individuals and immunizations of large numbers of people.

Pandemic preparedness can be especially problematic with regard to subsets of the population, who may be characterized as "hard to reach" (HTR).³ Although no uniform definition of HTR populations exists, they may be defined from two perspectives: personal characteristics associated with limited access to healthcare (eg, racial/ethnic minorities, non-English speakers, persons who are socially isolated, persons who are engaged in illegal activities, people who are distrust of government) and degree of linkage with the healthcare system (eg, persons who do not seek treatment in traditional healthcare settings such as provider offices or clinics). Thus, many are underserved in part because they lack the necessary connections to be served. There appears to be a substantial overlap between HTR status and risk; although not all individuals at high risk are hard to reach, many in the HTR populations are at high risk.

It is possible that members of HTR populations may be protected sufficiently by herd immunity if vaccine coverage achieves sufficiently high levels in the general population.⁴ However, this does not take into account either the greater vulnerability of HTR

populations to influenza or the potential role of members of these groups as key sentinel or bridge populations. First, HTR populations may be at higher risk of pandemic influenza virus infection and its consequences based on occupational exposures. For example, the poultry processing industry overwhelmingly hires socially isolated networks of undereducated and non-English speaking persons.⁵ In addition, other unskilled or semiskilled occupations such as domestics, office service industries, and home healthcare aides disproportionately hire from non-English speaking and socially isolated communities; these occupations involve interface with the public putting them at risk. These occupations highlight the heightened risk of exposure among some HTR populations potentially obviating the possible benefit of herd immunity and further illustrating the extent to which these groups pose special challenges.

Second, economically and socially marginalized HTR populations may contract influenza in disproportionate numbers because of heightened vulnerability to infection. Individual measures of chronic stress have been shown to directly influence susceptibility to viral and bacterial infections, including influenza.^{6,7} Moreover, several human viral challenge studies have indicated that various forms of psychosocial stress influence the ability of the immune system to protect against infection from microbial challenge.⁸ In addition, surveillance efforts during the 1918 pandemic suggested a relationship between persons of lower economic status and increased attack rates.⁹

Finally, HTR populations may serve as either sentinel or bridge populations for influenza infection. Although it is likely that a pandemic would begin among persons with direct contact with poultry,¹⁰ if it should spread to HTR population members of these groups, then they could serve as a significant bridge population to others, a factor of special concern in the face of expected delays in vaccine manufacturing and supply or uneven distribution. In addition, in the absence of adequate control measures, influenza may especially spread rapidly among unvaccinated individuals living in close contact.¹¹ Thus, members of HTR populations, at economic disadvantage and more likely to live in conditions of overcrowding, may both contract and transmit influenza more rapidly to others. The public interface with those in unskilled or semiskilled occupations such as domestics, home healthcare, food service, and office service industry workers requires that efforts be made to address these populations through outreach programs.

For these reasons, the planning process for an influenza pandemic should include strategies directed toward HTR populations at the individual, provider, and system levels, which go beyond traditional providers to involve community-based organizations. Approaches have been identified at the individual, provider, and system levels that could contribute to filling existing gaps in pandemic preparedness plans.¹² In general, at the individual level, partnering with faith-based or other trusted organizations in all aspects of pandemic preparedness planning, and alerting target populations through community-based educational campaigns, is key.^{3,13} At the provider level, the healthcare base may need to be expanded to include additional nurses and pharmacists as vaccinators, and immunization protocols were simplified so as to be as efficient as possible.^{14,15} At the structural level, prioritizing members of HTR populations, utilizing community-based points of distribution sites, or going door to door for educational outreach and mass immunization distribution efforts may maximize access to HTR populations.^{3,16}

Considerable effort in planning for influenza immunization programs and pandemic preparedness has focused on delineation and prioritization of risk

groups and preparing the existing medical care and public health infrastructure.² This evolving system, however, has given limited attention to the public health importance of, and effective service delivery to the HTR, although members of these groups are important because of issues related to vulnerability and transmission of the disease. To be operationally successful with relation to the HTR, the precise content and methods of educational outreach about precautions to take before and after vaccine is available, and methods for immunization distribution need to be tailored to each site and each community.¹⁷ Input should therefore be sought from target communities in the design of services. Local planning must be comprehensive and involve all sectors, including residents, business owners, health officials, law enforcement personnel, and neighborhood community board members.¹⁸ Although this may appear inefficient, if not daunting, organizing a public health infrastructure approach to pandemic influenza control requires incorporating members of the HTR community within a broader diversity of approaches that should build upon existing public health practices so as to address the needs of this vulnerable portion of our population.

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